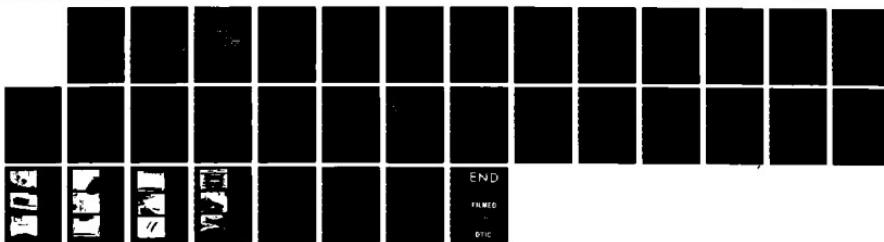


RD-R161 851 CERTIFICATION TEST CNU-399/E MAVERICK MISSILE CONTAINER 1/1  
(U) AIR FORCE PACKAGING EVALUATION AGENCY  
WRIGHT-PATTERSON AFB OH E J KOWALSKI OCT 85

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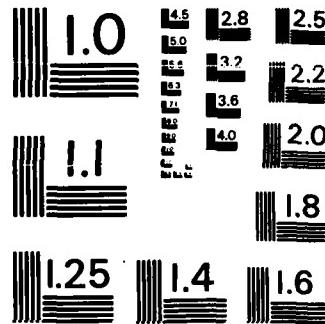
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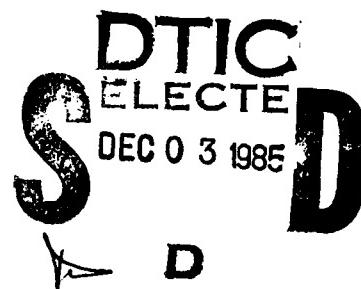
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Report No. 85-R-05  
AFPEA Project No. 84-P-107

AD-A161 851

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CERTIFICATION TEST  
CNU-399/E MAVERICK MISSILE CONTAINER

HQ AFLC/DSTZ  
AIR FORCE PACKAGING EVALUATION AGENCY  
Wright-Patterson AFB Ohio 45433-5999

October 1985

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AFPEA PROJECT NO. 84-P-107

TITLE: Certification Test, CNU-399/E Maverick Missile Container

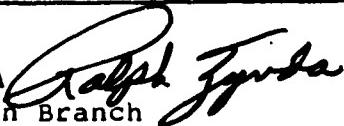
**ABSTRACT**

The Air Force Packaging Evaluation Agency (AFPEA) Wright-Patterson AFB OH 45433-5999 was requested by ASD/TAM to conduct a certification test on a prototype CNU-399/E Maverick Missile Container.

Tests were conducted in accordance with Federal Test Method Standard (FTMS) No. 101, Military Standard 648 (MIL-STD-648), Military Standard 810 (MIL-STD-810), and Military Standard 1489 (MIL-STD-1489).

Results of the tests conducted on container Serial No. 83-0021 are acceptable. The prototype CNU-399/E Maverick Missile Container will adequately protect the Maverick Missile, AGM-65A/B/C/D/E/F all-up-around, and the Maverick missile less both the guidance unit and the hydraulic actuating system during worldwide shipments in the public domain.

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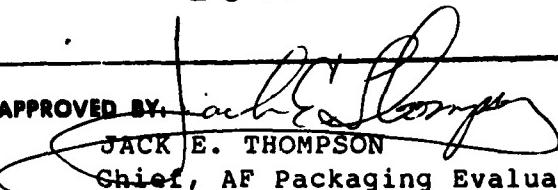
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## INTRODUCTION:

BACKGROUND: HQ Aeronautical Systems Division (ASD/TAM), Wright-Patterson AFB, OH 45433-5999 requested assistance from the Air Force Packaging Evaluation Agency (AFPEA) to conduct certification testing on a new Maverick missile container. The prototype container was fabricated by a contractor and shipped to AFPEA for testing.

PURPOSE: The purpose of this project was to determine if the prototype container CNU-399/E will protect its contents, the AGM-65A/B/C/D/E/F All-UP-Round (AUR) Maverick Missile (Figure 1) and components (Figure 2) during worldwide shipments in the public domain.—

TEST SPECIMEN: ONE CNU-399/E Maverick Missile container, serial number 83-0021 (Figure 3 and 4) fabricated from fiberglass material (resin transfer molded) by Plastics Research Corporation (PRC) 12837 Bettencourt Street, Cerritos, CA 90701 was used for certification testing. The container was designed to limit the transmission of shocks to its contents at a maximum of 40Gs resultant force and provide environmental protection to its contents..

TEST OUTLINE AND TEST EQUIPMENT: Tests were conducted in accordance with AFPEA container test plan, project No. 84-P-107, dated 10 May 85 (Table 1). Test methods and procedures used were as outlined in FTMS No. 101, MIL-STD-648, MIL-STD-810, and MIL-STD-1489. Instrumentation and equipment used are annotated in each test procedure.

## TEST PROCEDURES AND RESULTS

### LEAK TEST

Test No. 1: The container was visually inspected as received from the contractor. The exterior and interior surfaces, markings, hardware, cushioning, strapping, and container seal were inspected for manufacturing imperfections. An inert Maverick Missile was installed in the container. A tri-axial accelerometer was mounted on the center of gravity of the missile, the container was closed, the tee-bolts were torqued to 100 inch pounds, and a leak test was performed. The pneumatic pressure and vacuum retention tests were performed in accordance with FTMS No. 101, Method 5009.1 paragraph 6.1 and 6.3 at 1.00 PSIG (pounds per square inch gauge). The failure criteria for each test was 0.050 PSIG for a 60 minute period.

Results: Results of the visual inspection are annotated in Table II. Torque values were measured below 100 inch pounds on 10

Keywords: leak; fatigue shock;  
strength; tensile strength;

tee-bolts when received from PRC. The container weight was over the maximum allowable weight identified in the contract of 380 pounds. Overall, better than average workmanship was noted on the container. At the end of the 60 minute pressure/vacuum leak test period, the results were as follows:

Pressure loss during leak test, 0.009 PSIG  
Vacuum loss during leak test, 0.018 PSIG

The results of the tests are acceptable.

#### REPETITIVE SHOCK

Test No. 2a: The repetitive shock test was conducted in accordance with MIL-STD-648 and FTMS No. 101, Method 5019.1. The container was placed on a L.A.B. Corporation, Skaneateles, NY 13152 vibration test machine (LWVH), Type 5000-96B, Serial Number 56801. The container was placed on, but not fastened to the platform. Restraining blocks were attached to the platform to prevent the container from moving off the platform. A clearance of approximately 1/2 inch in all directions was used for the restraint blocks to allow free movement of the container during the two-hour test period. With the container in position, the platform was vibrated until the container raised from the platform (1/16 inch feeler gauge clearance between bottom of container and platform) for a maximum platform acceleration of 1G.

Results: Visual inspection revealed no damage to the container. A maximum of 3.7 Gs at 4.3 Hz and a 74 degree F cushion temperature were recorded during the test. The results of the test are acceptable.

Test No. 2b: The repetitive shock test with a superimposed load (stacked three high and banded, Figure 5) was conducted in accordance with MIL-STD-648 and FTMS No. 101, Method 5019.1. The same procedure for testing the superimposed load used was as indicated in Test No. 2a.

Results: Visual inspection revealed no damage to the container. A maximum of 6.4 Gs at 4.0 Hz and a 74 degree F cushion temperature were recorded during the test. The results of the test are acceptable.

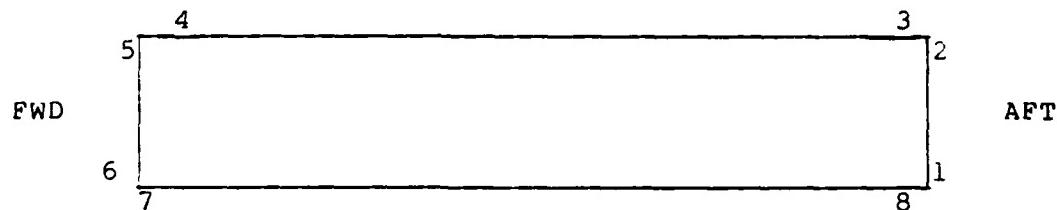
#### LEAK TEST

Test No. 3: The pneumatic pressure test was conducted in accordance with FTMS NO. 101, Method 5009.1. The test was performed at 1.00 PSIG. The failure criteria for the test was 0.013 PSIG. during the 15 minute period.

Results: At the end of the 15 minute pressure test, the result was as follows:

Pressure loss during leak test 0.000 PSIG

The result of the test is acceptable.



CNU-399/E Maverick Missile Container, Serial No. 83-0021 corner marking for reference in test data.

ROUGH HANDLING TEST (LOW TEMPERATURE -40 DEGREE F)

Test No. 4a: The container was placed in a low temperature environmental chamber for a period of 24 hours at -40 degree F (Chart No. 1). The low temperature cornerwise-drop (rotational) test was conducted in accordance with FTMS No. 101, Method 5005.1. The height of the drop was 20 inches.

Results: Visual inspection revealed no damage to the container. A maximum of 18.2Gs was recorded during the test. The results of the test are acceptable.

Test No. 4b: The low temperature edgewise-drop (rotational) test was conducted in accordance with FTMS No. 101, Method 5008.1. The height of the drop was 20 inches.

Results: Visual inspection revealed no damage to the container. A maximum of 15.7 Gs was obtained during the test. The results of the test are acceptable.

Test No. 4c: The low temperature pendulum impact test was conducted in accordance with FTMS No. 101, Method 5012. The impact velocity was 10 feet/second, the drop height was 18.60 inches.

Results: Visual inspection revealed no damage to the container. A maximum of 29.8 Gs was recorded during the test. The results of the test are acceptable.

#### LEAK TEST

Test No. 5: The pneumatic pressure test was conducted in accordance with FTMS No. 101, Method 5009.1. The test was performed at 1.00 PSIG. The failure criteria for the test was 0.013 PSIG. during the 15 minute period.

Results: At the end of the 15 minute pressure test, the result was as follows:

Pressure loss during leak test, 0.016 PSIG.

The result of the test exceed the allowable limit of .013 PSIG.

#### ROUGH HANDLING TEST (HIGH TEMPERATURE +140 DEGREE F)

Test No. 6a: The container was placed in a high temperature environmental chamber for a period of 24 hours at +140 degree F (Chart No. 2). The high temperature cornerwise-drop (rotational) test was conducted in accordance with FTMS No. 101, Method 5005.1. The height of the drop was 20 inches.

Results: Visual inspection revealed no damage to the container. A maximum of 13.3 Gs was recorded during the test. The results of the test are acceptable.

Test No. 6b: The high temperature edgewise drop (rotational) test was conducted in accordance with FTMS No. 101, Method 5008.1. The height of the drop was 20 inches.

Results: Visual inspection revealed no damage to the container. A maximum of 15.3 Gs was recorded during the test. The results of the test are acceptable.

Test No. 6c: The high temperature pendulum impact test was conducted in accordance with FTMS No. 101, Method 5012. The impact velocity was 10 ft./sec., the drop height was 18.60 inches.

Results: Visual inspection revealed no damage to the container. A maximum of 32.7 Gs was recorded during the test. The results of the test are acceptable.

#### LEAK TEST

Test No. 7: The pneumatic pressure test was conducted in accordance with FTMS No. 101, Method 5009.1. The test was performed at 1.00 PSIG. The failure criteria for the test was 0.013 PSIG during the 15 minute period.

Results: At the end of the 15 minute pressure test, the result was as follows:

Pressure loss during leak test, 0.014 PSIG.

The result of the test exceeded the allowable limit of .013 PSIG.

#### ROUGH HANDLING TEST (AMBIENT)

Test No. 8: The container was stacked two high and banded. The ambient pendulum-impact test was conducted in accordance with FTMS No. 101, Method 5012. The impact velocity was 10 ft./sec., the drop height was 18.60 inches.

Results: On the second impact (End 5-6) the upper container moved forward over the lower container's stacking index 3 1/2 inches (Figure 6 and 7). This movement created excessive pressure on corners 4 and 7 and caused some noticeable damage to these areas. The hairline cracks measured 6 inches on corner 6, and 7 inches on corner 7. Visual inspection revealed no additional damage to the container. A maximum of 23.4 Gs was recorded during the test. The results of the test are acceptable.

Test No. 9: The stacked cornerwise-drop (rotational) test (Figure 8) was conducted in accordance with FTMS No. 101, Method 5005.1. The drop height was 17 inches.

Results: Visual inspection revealed no additional damage to the container. A maximum of 12.5 Gs was recorded during the test. The results of the test are acceptable.

Test No. 19: The stacked edgewise-drop (rotational) test was conducted in accordance with FTMS No. 101, Method 5008.1. The drop height was 17 inches.

Results: Visual inspection revealed no additional damage to the container. A maximum of 13.2 Gs was recorded during the test. The results of the test are acceptable.

#### LEAK TEST

Test No. 10: The pneumatic pressure test was conducted in accordance with FTMS No. 101, Method 5009.1. This test was performed at 1.00 PSIG. The failure criteria for the test was 0.013 PSIG during the 15 minute period.

Results: At the end of the 15 minute pressure test, the result was as follows:

Pressure loss during leak test, 0.013 PSIG.

The result of the test is acceptable.

## HOISTING STRENGTH TEST

Test No. 11: The hoisting strength test was conducted in accordance with MIL-STD-648, para 4.17.3.1 and 5.8.1. The containers were stacked 2 high banded and were hoisted by one lift point and left hanging for one hour (Figure 9). The test was continued by loading the container to five times its gross weight. The container was then hoisted by all of its lift points and left hanging for a period of one hour (Figure 10).

Results: Visual inspection revealed no damage to the container. The results of the tests are acceptable.

## LEAK TEST

Test No. 12: The pneumatic pressure test was conducted in accordance with FTMS No. 101, Method 5009.1. The test was performed at 1.00 PSIG. The failure criteria for the test was 0.013 PSIG during the 15 minute period.

Results: At the end of the 15 minute pressure test, the result was as follows:

Pressure loss during leak test, 0.015 PSIG.

The result of the test exceeded the allowable limit of .013 PSIG.

The following test was not a certification requirement for the CNU-399/E Maverick Missile container; however, the data is provided as additional information.

## PUNCTURE TEST

Test No. 13: The pendulum puncture test was conducted in accordance with MIL-STD-1489, Method 505. The test apparatus used was a simulated forklift tine weighing 70 pounds, suspended from a height of 14 feet above the floor by wire cables (Figures 11 and 12). One tine was gradually pulled straight back until it reached a height of 20 inches above its equilibrium height and released. The tine impact was made to each side of the container at 1 1/2 inches above the enclosed forklift pocket.

Results: Visual inspection revealed slight damage at the impact area on both sides of the container.

## LEAK TEST

Test No. 14: The pneumatic pressure/vacuum retention test was conducted in accordance with FTMS No. 101, Method 5009.1. The test was performed at 1.00 PSIG. The failure criteria for the test was 0.000 PSIG for a 60 minute period.

Results: The pressure leak test was discontinued after 15 minutes since a pressure loss of 0.047 PSIG was recorded at the end of the 15 minute period. Inspection with a General Electric, Industrial Halogen Leak Detector, Cat. No. 50-42081OHFJKI revealed no leakage to the one side impacted by the tine. However, excessive leakage was detected and accounted for most of the 0.047 PSIG pressure loss on the opposite side that was impacted by the tine.

The following tests also were not contractual performance certification requirements for the CNU-399/E Maverick Missile container. However, the data is provided as additional information only for those DOD personnel that requested these tests. Container Serial Number 83-0020 was used for testing. These tests were conducted after all of the qualification tests were completed using container Serial Number 83-0020.

#### RAIN WITH WIND SOURCE

Test No. 15: The container was placed in a rain/wind environmental chamber. The test was conducted in accordance with MIL-STD-810, Method 506.1, Procedure I. The test was modified by extending the test to eight cycles for a total of four hours.

Results: Visual inspection revealed no water entry into the container. Result of the test is acceptable.

#### LEAKS IN CONTAINER

Test No. 16: The water submersion test was conducted in accordance with FTMS No. 101, Method 5009.1, paragraph 6.6. The container submersion test was extended to 24 hours.

Results: Visual inspection revealed no water entry into the container. Result of the test is acceptable.

#### LEAK TEST

Test No. 17: The pneumatic pressure and vacuum retention tests were performed in accordance with FTMS No. 101, Method 5009.1, paragraph 1 and 6.3 at 1.00 PSIG. The failure criteria for each test was 0.050 PSIG for a 60-minute period.

Results: At the end of the 60 minute pneumatic pressure/vacuum retention test period the results were as follows:

Pressure loss during leak test, 0.018 PSIG.  
Vacuum loss during leak test, 0.009 PSIG.

The results of the tests are acceptable.

#### FREE FALL FLAT DROP

Test No. 18: The container loaded with the heaviest all-up-round, 670 pound, inert Maverick Missile was hoisted to a height of four feet. The bottom of the container was parallel with a concrete striking surface. One drop was made at ambient temperature.

Results: Visual inspection revealed no damage to the container. Result of the test is acceptable.

Leak Test: A pneumatic pressure and vacuum retention test was performed on the container after the four foot free fall flat drop. The tests were conducted in accordance with FTMS No. 101, Method 5009.1, paragraph 6.1 and 6.3 at 1.00 PSIG. The failure criteria for each test was 0.050 PSIG for a 60-minute period.

Results: At the end of the 60 minute pneumatic pressure/vacuum retention test period the results were as follows:

Pressure loss during leak test, 0.011 PSIG.  
Vacuum loss during leak test, 0.011 PSIG.

The results of the tests are acceptable.

#### CONCLUSIONS:

The container certification test is a safety requirement which pertains to the safe shipment of explosives in the public domain. This test was performed primarily to evaluate the container's performance in containing its contents during shipments and storage. The pneumatic pressure and vacuum retention tests used in this evaluation were performed to better evaluate the container's design and structural properties after the different test phases were completed.

The performance of the container is considered very good from a safety standpoint. The container has passed all of the certification test requirements established in the container test plan (Table 1).

The pressure/vacuum leak test results annotated outside of the 0.013 PSIG in a 15 minute period should not be interpreted as a failure of the container's capability to contain its contents.

#### RECOMMENDATIONS:

1. To maintain a product that will give proper protection to its contents, the AGM-65 Maverick Missile, a good quality control program should be established to maintain the integrity of this

container design throughout production.

2. Since the original weight of the container was raised from 350 pounds maximum to 380 pounds maximum and the weight of the container tested was 408 pounds, this 408 pound weight should be maintained within five percent to ensure the structural strength of the container.

3. Level 3 drawings should correspond to the dimensions of container Serial No. 83-0021. These drawings should be used in the production of the CNU-399/E Maverick Missile container.

TABLE I

AIR FORCE PACKAGING EVALUATION AGENCY (Container Test Plan)				AFPEA PROJECT NUMBER 84-P-107	
CONTAINER SIZE (L X W X D)(INCHES) INTERIOR EXTERIOR: 110"x32"x30"		WEIGHT (LBS) GROSS: 1078/705	CUBE (CU. FT.) ITEM: 670/297	QUANTITY 1	DATE Revised 10 May 84
ITEM NAME AGM-65 Maverick Missile		MANUFACTURER Plastics Research Corp, Cerritos CA 90701			
CONTAINER NAME CNU-399/E		CONTAINER COST N/A			
PACK DESCRIPTION Fiberglass Construction					
CONDITIONING As noted in test plan					
TEST NO.	REF STD/SPEC AND TEST METHOD OR PROCEDURE NO's	TEST TITLE AND PARAMETERS	CONTAINER ORIENTATION		INSTRUMENTATION
	CERTIFICATION TEST	REQUIREMENTS  The following certification test must be performed on the Maverick container in addition to those called out in the specification before the container can be certified for safe shipment in the public domain. The container selected for these tests will be different from that used in the qualification test program.			
1.	<u>LEAK TEST</u>  Fed-Std-101 Method 5009.1 (4.2.2.1.13)	Leak Test: Pneumatic Pressure, 1.00 PSI Vacuum Pressure, 1.00 PSI Leakage must be less than 0.050 PSI per hour.	Test at ambient condition from compressed air supply/vacuum pump.		Water Manometer
2.	<u>REPETITIVE SHOCK</u>  a. Mil-Std-648 Para 5.2.2 and Fed-Std-101 Method 5019.1 (4.2.2.1.3)	Repetitive Shock Test, test at 3 to 5 Hz or 1G whichever is less. Test for not less than 2 hours.	Test: 1. Lightest AUR w/o GU and HAS.		Tri-axial accelerometer
b.	Mil-Std-648 Para 5.2.2.1 (4.2.2.1.4)	Repetitive Shock Test with Superimposed Load, test at 3 to 5 Hz or 1G whichever is less, test for not less than 2 hours. Banding of containers shall be through the banding reliefs provided in the container.	Stack 3 high, test bottom container.  Test: 1. Lightest AUR w/o GU and HAS.		Tri-axial accelerometer
3.	<u>LEAK TEST</u>  Fed-Std-101 Method 5009.1 (4.2.2.1.13)	Leak Test: Pneumatic pressure 1.00 PSI	1. Pressure Test only to 1.00 PSI 2. Test duration		Water Manometer

## COMMENTS

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RALPH ZYNTA, Chief, Design Br., AFPEA

<b>AIR FORCE PACKAGING EVALUATION AGENCY<sup>1</sup></b> <b>(Container Test Plan)</b>					<b>AFPEA PROJECT NUMBER</b> 84-P-107
<b>CONTAINER SIZE (L X W X D)(INCHES)</b> INTERIOR: EXTERIOR:		<b>WEIGHT (LBS)</b> GROSS: ITEM:	<b>CUBE (CU. FT.)</b>	<b>QUANTITY</b> 1	<b>DATE</b> Revised 10 May 84
<b>ITEM NAME</b> AGM-65 Maverick Missile		<b>MANUFACTURER</b> Plastics Research Corp, Cerritos CA 90701			
<b>CONTAINER NAME</b> CNU-399/E		<b>CONTAINER COST</b> N/A			
<b>PACK DESCRIPTION</b> Fiberglass Construction					
<b>CONDITIONING</b> As noted in test plan					
<b>TEST NO.</b>	<b>REF STD-SPEC AND TEST METHOD OR PROCEDURE NOS</b>	<b>TEST TITLE AND PARAMETERS</b>		<b>CONTAINER ORIENTATION</b>	<b>INSTRUMENTATION</b>
4.	<u>ROUGH HANDLING TESTS (LOW TEMPERATURE -40° F)</u>		to be 15 minutes 3. Leakage must be less than 0.013 PSI per 15 minutes		
a.	Fed-Std-101 Method 5005.1 (4.2.2.1.8)	Low Temperature Cornerwise-drop (Rotational) Test, T= -40° F for not less than 24 hours, drop height 20 inches.	Test in chamber, one drop on diagonal bottom corners. Total of 2 drops.	Tri-Axial accelerometer	
b.	Fed-Std-101 Method 5008.1 (4.2.2.1.8)	Low Temperature Edgewise-Drop (Rotational Test, T= -40° F for not less than 24 hours, drop height 20 inches.	Test in chamber, one drop on two bottom edge, total of 2 drops.	Tri-axial accelerometer	
c.	Fed-Std-101 Method 5012 (4.2.2.1.8)	Low Temperature Pendulum-Impact Test, T= -65° F for not less than 6 hours, temperature of shock mitigation system at time of test shall be -40° F (-20/+0° F). Impact velocity 10 ft/sec. Drop height 18.6 inches.	One impact on each side and each end total of 4 impacts	Tri-axial accelerometer	
5.	<u>LEAK TEST</u>		Test: 1. w/heaviest AUR.	Thermocouples	
	Fed-Std-101 Method 5009.1	Leak Test: Pneumatic Pressure 1.00 PSI	1. Pressure Test only to 1.00 PSI	Water Manometer	

**COMMENTS**

**PREPARED BY**  
Edward J. Kowalski, Mech Engr

**APPROVED BY**  
RALPH ZYNTA, Chief, Design Br., AFPEA

AIR FORCE PACKAGING EVALUATION AGENCY (Container Test Plan)					AFPEA PROJECT NUMBER 84-107
CONTAINER SIZE (L X W X D)(INCHES) INTERIOR: EXTERIOR:		WEIGHT (LBS) GROSS: ITEM:	CUBE (CU. FT.)	QUANTITY 1	DATE Revised 10 May 84
ITEM NAME AGM-65 Maverick Missile		MANUFACTURER Plastic Research Corp, Cerritos CA 90701			
CONTAINER NAME CNU-399/E		CONTAINER COST N/A			
PACK DESCRIPTION Fiberglass Construction					
CONDITIONING As noted in test plan					
TEST NO.	REF STD/SPEC AND TEST METHOD OR PROCEDURE NOS.	TEST TITLE AND PARAMETERS	CONTAINER ORIENTATION	INSTRUMENTATION	
6.	(4.2.2.1.13)		2. Test duration to be 15 minutes. 3. Leakage must be less than 0.013 PSI per 15 minutes.		
	a. Fed-Std-101 Method 5005.1 (4.2.2.1.7)	ROUGH HANDLING TEST (HIGH TEMPERATURE +140°F)  High Temperature Cornerwise-drop (Rotational) Test, heat in chamber +140°F for not less than 24 hours, drop height 20 inches.	**Test is performed Tri-axial in heat chamber, one drop on diagonal bottom corners, total of 2 drops.	accelerometer	
	b. Fed-Std-101 Method 5008.1 (4.2.2.1.7)	High Temperature Edgewise-drop (Rotational) Test, heat in chamber +140°F for not less than 24 hours, drop height 20 inches.	**One drop to two bottom edges, total of 2 drops.	Tri-axial accelerometer	
c. Fed-Std-101 Method 5012 (4.2.2.1.7)	High Temperature Pendulum-Impact Test, heat in chamber +165°F for period not less than 6 hrs, temperature of shock mitigation system at time of test shall be +140°F (-0/+20°F). Impact velocity 10 ft/sec, drop from 18.60 inches.	One impact on each side and each end, total of 4 impacts.	Tri-axial accelerometer Thermocouples		

COMMENTS NOTE: \*\* These corners or edges as applicable are opposite those impacted during low temperature test.

PREPARED BY

Edward J. Kowalski, Mech Engr.

APPROVED BY

RALPH ZYNDA, Chief, Design Br., AFPEA

AFALD 10-84

**AIR FORCE PACKAGING EVALUATION AGENCY**  
 (Container Test Plan)

APPEA PROJECT NUMBER

84-P-107

CONTAINER SIZE (L X W X D) (INCHES) INTERIOR:	EXTERIOR:	WEIGHT (LBG) GROSS:	ITEM	CUBE (CU FT)	QUANTITY	DATE Revised
					1	5 Aug 85

ITEM NAME AGM-65 Maverick Missile	MANUFACTURER Plastics Research Corp., Cerritos CA 90701
--------------------------------------	--

CONTAINER NAME CHU-399/B	CONTAINER COST N/A
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**PACK DESCRIPTION**

Fiberglass Construction

**CONSIDERATIONS**

As noted in test plan

TEST NO.	REF STD/SPEC AND TEST METHOD OR PROCEDURE NO.	TEST TITLE AND PARAMETERS	CONTAINER ORIENTATION	INSTRUMENTATION
7.	<u>LEAK TEST</u>  Fed-Std-101 Method 5009.1 (4.2.2.1.13)	Leak Test: Pneumatic Pressure, 1.00 PSI.	1. Pressure test only to 1.00 PSI. 2. Test duration to be 15 minutes. 3. Leakage must be less than 0.013 PSI per 15-minutes.	Water Manometer
8.	<u>ROUGH HANDLING TEST (AMBIENT)</u>  Fed-Std-101 Method 5012 (4.2.2.1.1)	Stacked pendulum impact test, impact velocity 10 ft/sec drop height 18.60 inches. Banding of containers shall be through the banding reliefs provided on the container.	Stacked 2 high and banded, one impact on each end and each side, total of four impacts.	Tri-axial Accelerometer
9.	 Fed-Std-101 Method 5005.1 (4.2.2.1.1)	Stacked cornerwise drop (rotational) test, drop height 17 inches banding shall be through the banding reliefs provided on container.	Test w/heaviest AUR.  Stacked 2 high and banded, one drop on each bottom corner, total of 4 drops.	Tri-axial Accelerometer

**COMMENTS:**

\*\*Revised 5 Aug 85

**PREPARED BY:**

Edward J. Kowalski, Mech Engr

**APPROVED BY**

RALPH ZYNTA, Chief, Design Br, APPEA

**AIR FORCE PACKAGING EVALUATION AGENCY**  
 (Container Test Plan)

APPEA PROJECT NUMBER

84-P-107

CONTAINER SIZE (L X W X D) (INCHES)  
 INTERIOR: EXTERIOR:

WEIGHT (LBS)  
 GROSS ITEM

CUBE (CU FT)

QUANTITY

DATE  
 Revised  
 5 Aug 85

ITEM NAME  
**AGM-65 Maverick Missile**

MANUFACTURER

Plastics Research Corp, Cerritos CA 90530

CONTAINER NAME  
**CBU-39B/2**

CONTAINER COST

N/A

**PACK DESCRIPTION**

Fiberglass Construction

**CONTAINERS**

All noted in test plan

TEST NO.	REF STD. SPEC AND TEST METHOD OR PROCEDURE NO.	TEST TITLE AND PARAMETERS	CONTAINER ORIENTATION	INSTRUMENTATION
**			Test w/heaviest AUR.	
10. <u>LEAK TEST</u>	Ped-Std-101 Method 5009.1 (4.2.2.1.13)	Leak Test: Pneumatic pressure, 1.00 PSI.	1. Pressure test only to 1.00 PSI. 2. Test duration to be 15 minutes. 3. Leakage must be less than 0.013 PSI per 15 minutes.	Water Manometer
11. <u>HOISTING STRENGTH TEST</u>	MIL-STD-648 Para 4.17.3.1 & 5.8.1 (4.2.2.1.12)	Hoist banded containers at one lift point and leave hanging 1 hour. Hoist banded containers loaded to 5 times gross weight (of single container) by all lift points simultaneously and leave hanging for 1 hour.	Stacked 2 high and banded.  Test w/heaviest AUR.	
**	12. <u>LEAK TEST</u>	Ped-Std-101 Method 5009.1 (4.2.2.1.13)	Leak Test: Pneumatic pressure, 1.00 PSI.	1. Pressure test only to 1.00 PSI.

**COMMENTS:**

\*\* Revised 5 Aug 85

**PREPARED BY**

Edward J. Kowalski, Mech Engr

**APPROVED BY**

RALPH ZYNDA, Chief, Design Br, APPEA

## (Container Test Plan)

CONTAINER SIZE (L X W X D) (INCHES) EXTERIOR		GROSS	ITEM	CUBE (CU FT)	QUANTITY	DATE Revised 5 Aug 85
ITEM NAME AGM-65 Maverick Missile		MANUFACTURER Plastics Research Corp, Cerritos CA 90701				
CONTAINER NAME CNU-399/E			CONTAINER COST N/A			
CASE DESCRIPTION						
FIBROGLASS CONSTRUCTION						
COMMENTS As noted in test plan						
TEST NO.	REF STD/SPEC AND TEST METHOD OR PROCEDURE NO.:	TEST TITLE AND PARAMETERS		CONTAINER ORIENTATION	INSTRUMENTATION	
13.	<u>PUNCTURE TEST</u>  MIL-STD-1489A Method 505	Impact will be made at a point 1-2 inches above the enclosed forklift. Pocket of the container base.		2. Test duration to be 15 minutes. 3. Leakage must be less than 0.013 PSI per 15 minutes.		
14.	<u>LEAK TEST</u>  Fed-Std-101 Method 5009.1	Leak Test: Pneumatic pressure 1.00 PSI Vacuum Test, 1.00 PSI Leakage must be less than 0.050 PSI per hour.		One impact to each side of container base, total 2 impacts.	N/A	
COMMENTS: * Revised 29 Apr 85, per ASD/TAM letter 19 Apr 85. ** Revised 5 Aug 85						
PREPARED BY Edward J. Kowalski, Mech Engr	APPROVED BY RALPH ZYNTA, Chief, Design Br, AFPEA			16a OF 16		

**AIR FORCE PACKAGING EVALUATION AGENCY**  
**(Container Test Plan)**

APPEA PROJECT NUMBER

84-F-107

CONTAINER SIZE H X W X D, INCHES INTERIOR	EXTERIOR	WEIGHT (LBS.) GROSS	CUBS, CU FT. ITEM	QUANTITY	DATE REVISED
				1	5 Aug 85
ITEM NAME		MANUFACTURER			
AGM-65 Maverick Missile		Plastics Research Corp, Cerritos CA 90701			
CONTAINER NAME		CONTAINER COST			
CHU-399/B		N/A			
TEST DESCRIPTION					
Fiberglass Construction					
COMMENTS					
As noted in test plan					
TEST NO.	REF STD/SPEC AND TEST METHOD OR PROCEDURE NO.:	TEST TITLE AND PARAMETERS	CONTAINER ORIENTATION	INSTRUMENTATION	
** 15.	<u>RAIN WITH WIND SOURCE</u>	MIL-STD-810 Method 506.1 Proc I Rain 4 inches per hour, wind velocity 40 miles per hour. Test duration 8 cycles, total 4 hours.	Place in rain/wind Environment Chamber.	N/A	
** 16.	<u>LEAKS IN CONTAINER</u>	Fed-Std-101 Method 5009.1 Para 6.6. Water submersion test, total submersion of container in water for period of 24 hours.	Place in tank of water for total submersion of container.	N/A	
** 17.	<u>LEAK TEST</u>	Fed-Std-101 Method 5009.1 Para 6.1, 6.3 Leak Test: Pneumatic pressure, 1.00PSI Vacuum pressure, 1.00PSI Leakage must be less than 0.050PSI per hour. Test duration to be a minimum of 60 minutes.	Test at ambient condition from compressed air supply/vacuum pump.	Water Manometer	
** 18.	<u>FREE FALL PLAT</u>	U.N. Standard (Ref ICAO 4.3) Low temperature - free fall drop test. Drop height 4 feet. T= 0 degree fahrenheit for not	Five drops (Bottom, top, side 1, side 2 & top corner)	N/A	

**Comments:**

\*\* Revised 5 Aug 85 per ASD/TAM request.

**PREPARED BY:**

Edward J. Kowalski, Mech Engr

**APPROVED BY:**

RALPH ZYNDA, Chief, Design Br. APPEA

186 OF 18

AIR FORCE PACKAGING EVALUATION AGENCY (Container Test Plan)					AFPEA PROJECT NUMBER 84-P-107
CONTAINER SIZE (L X W X D) INCHES INTERIOR EXTERIOR		WEIGHT (LBS) GROSS: ITEM	CUBE (CU FT)	QUANTITY	DATE Revised 5 Aug 85
ITEM NAME AGM-65 Maverick Missile		MANUFACTURER Plastics Research Corp, Cerritos CA 90701			
CONTAINER NAME CMU-399/B		CONTAINER COST N/A			
CONTAINER DESCRIPTION Fiberglass Construction					
COMMENTS As noted in test plan					
TEST NO.	REF STD/SPEC AND TEST METHOD OR PROCEDURE NO.:	TEST TITLE AND PARAMETERS	CONTAINER ORIENTATION	INSTRU- MENTATION	
		less than 16 hrs before test.	onto a concrete surface.  Test: 1. w/heaviest AUR. 2. one container for each test.		
** 19.	<u>ROUGH HANDLING</u>	<u>TEST (AMBIENT TEMPERATURE)</u>	Stacked 2 high and banded, one drop on each edge total of 4 drops.	Tri-axial Accelerometer	
**	<u>STACKING STABILITY TEST</u>	MIL-STD-648 Para 4.16.2	Stacking stability test. Stack each container individually. No banding required.	Stacked 6 high Test: 1. w/heaviest AUR.	N/A

## COMMENTS

\*\* Revised 5 Aug 85 per ASD/TAM request.

PREPARED BY

EDWARD J. KUMARSKY, Lead Engineer

APPROVED BY

Ralph S. Brown, Chief Design Bf

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TABLE II  
Visual Inspection

Requirement	Accept	Reject	Remarks
Weight pounds			1000
Base Section/Cover Section			
Forklift Pockets			
Stacking Interface			
Hoisting/Lie-Down Provisions			
Breathant Port			
Humidity Indicator			
Pressure Equalizing valve			
Electrical Grounding Connector			
Records Receptacle			
Security Seal			Seal must be made of steel or aluminum and be tamper proof.
Valveents			
Identification/Markings			
Human Performance			
Closure Hardware			Steel plate for no more than 1/8" thick and no sharp edges.
Container Seal			
Cushioning			Must be laminated from either HDPE or EVA foam and must be replaced if damaged or worn.
Strapping			
workmanship			

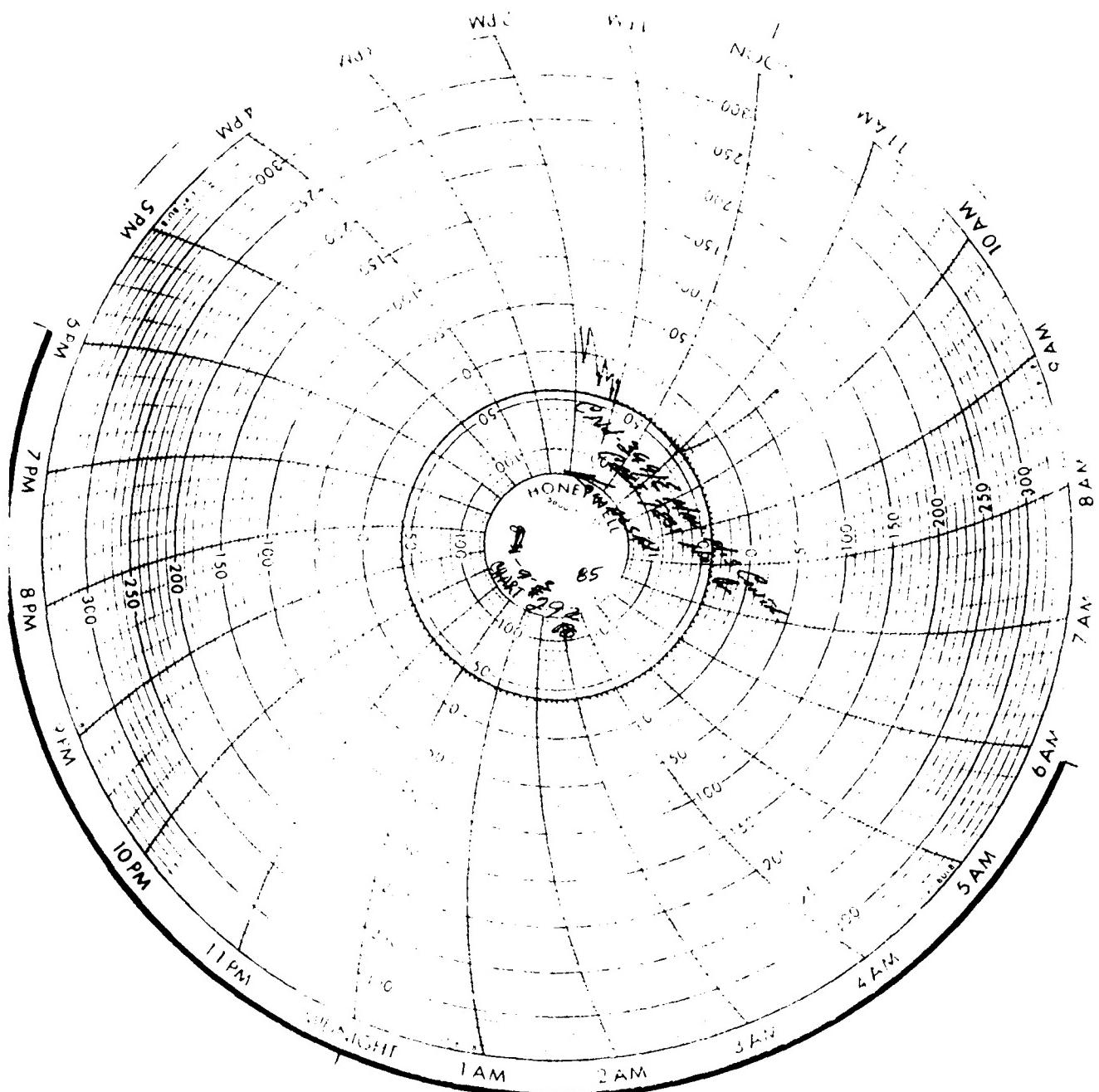


CHART No. 1

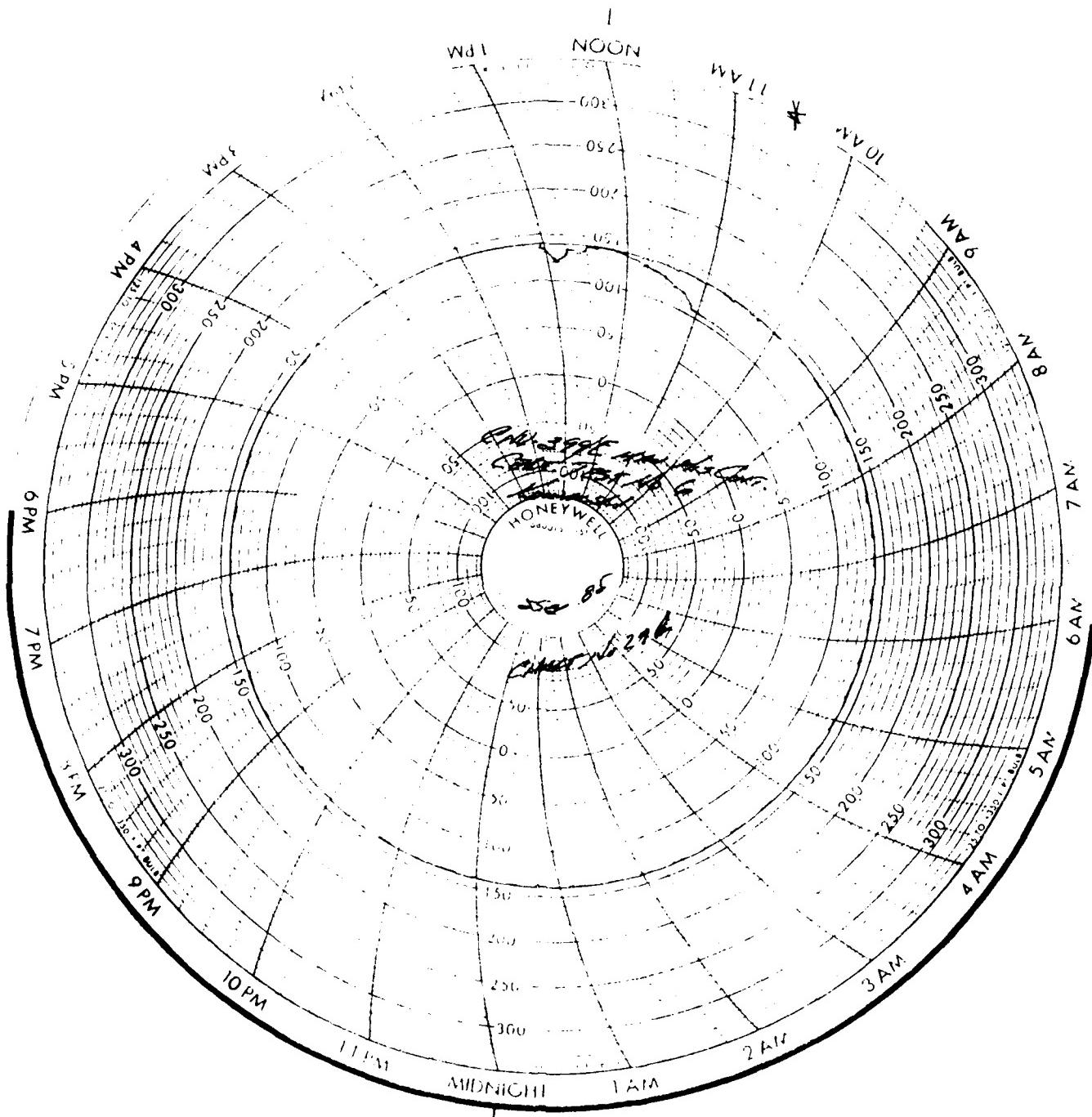
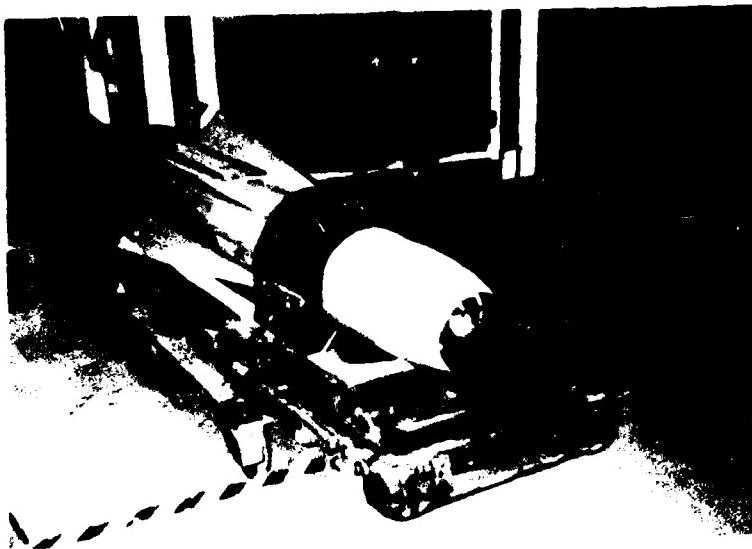
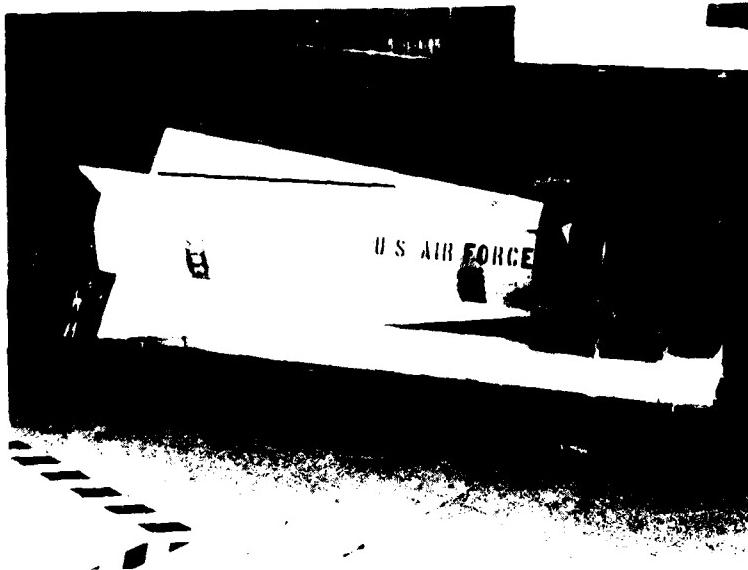


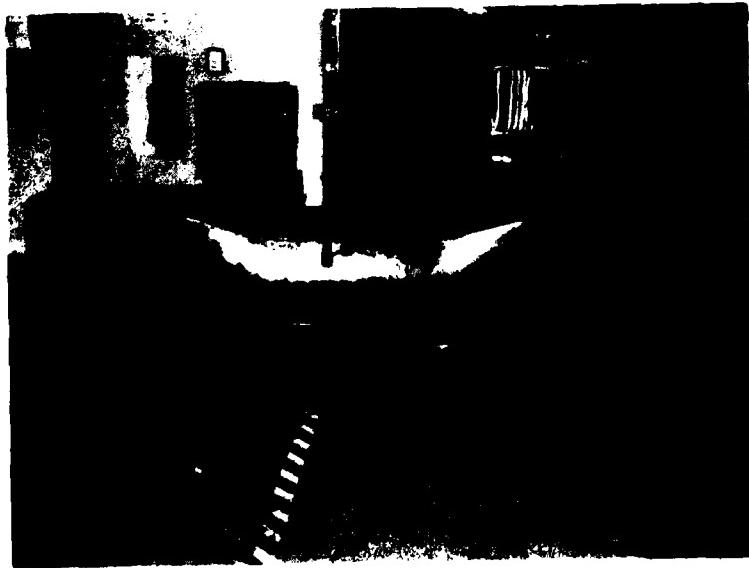
CHART No. 2



**Figure 1, AFM-65  
Maverick Missile  
(All-Up-Round)**



**Figure 2, AGM-65  
Maverick Missile  
(Center Body)**



**Figure 3, CNU-399/E  
Maverick Missile  
Container (Side View)**



Figure 4, CNU-399/E  
Maverick Missile  
Container (End View)



Figure 5, Repetitive  
Shock Test, (Stacked  
Three High)

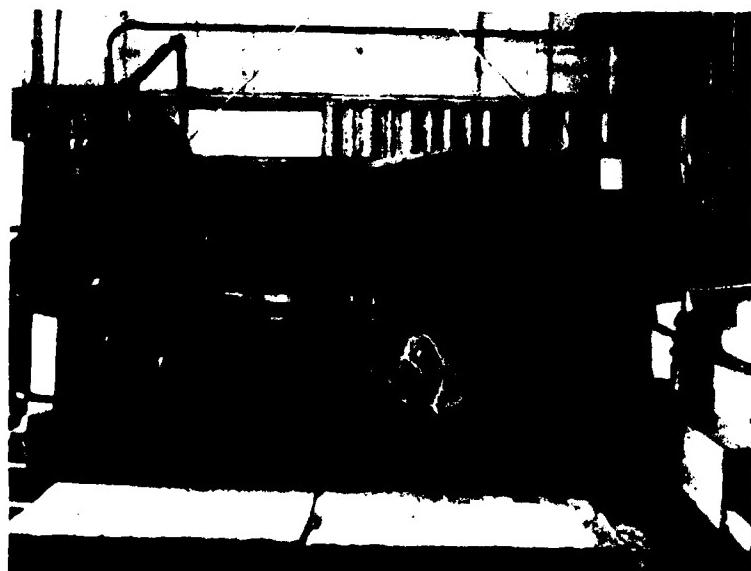


Figure 6, Pendulum-  
Impact Test (Stacked  
Two High)



Figure 7, Pendulum-  
Impact Test (Stacked  
Two High)

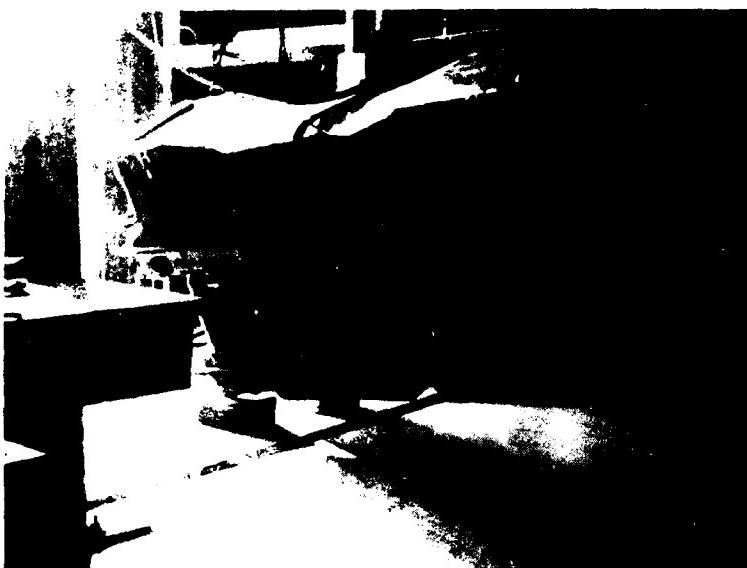
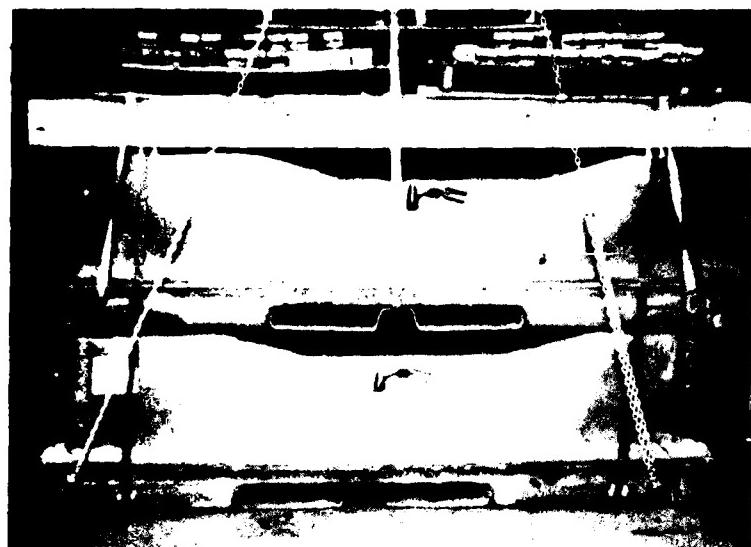


Figure 8, Cornerwise-  
Drop Test (Rotational)  
Test (Stacked Two High)



Figure 9, Hoisting  
Strength Test, One  
Lift Point



**Figure 10, Hoisting Strength Test, Four Lift Points**



**Figure 11, Pendulum Puncture Test**



**Figure 12, Pendulum Puncture Test**

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